

CLAIMS

What is claimed is:

- 1 1. A method of scanning the surface of a specimen, using a Scanning Electron Microscope
2 comprising the steps of:
3 generating a particle beam from a particle beam emitter; and
4 scanning the surface of the specimen by deflecting the particle beam at an angle with
5 respect to the orientation of the specimen such that the particle beam traverses an angle that is
6 not parallel or perpendicular to the orientation of the specimen.
- 1 2. A method as recited in claim 1, further comprising:
2 collecting the secondary and back scattered electrons generated when the particle beam
3 traversing across the surface of the specimen.
- 1 3. A method as recited in claim 1, wherein the specimen being scanned is a semiconductor
2 wafer or a photo mask.
- 1 4. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen in response to the application of an appropriate voltage
3 potential to the particle beam deflecting means.
- 1 5. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within a range of 1° and 89°.
- 1 6. A method as recited in claim 5, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within the range of 15° and 75°.
- 1 7. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within a range of 91° and 179°.
- 1 8. A method as recited in claim 7, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within the range of 105° and 165°.
- 1 9. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within a range of -179° and -91°.

- 1 10. A method as recited in claim 9, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within the range of -105° and -165° .
- 1 11. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within a range of -89° and -1° .
- 1 12. A method as recited in claim 11, wherein the particle beam is deflected at an angle
2 relative to the orientation of the specimen within the range of -15° and -75° .
- 1 13. An apparatus for scanning the surface of a specimen, using a Scanning Electron
2 Microscope comprising:
3 a particle beam emitter for emitting a particle beam in a SEM; and
4 a deflection unit operative to scan the surface of the specimen by bending the particle
5 beam at an angle relative to the orientation of the specimen, such that the particle beam traverses
6 an angle that is not parallel or perpendicular to the orientation of the specimen.
- 1 14. An apparatus as recited in claim 13, further comprising:
2 a detector system for collecting the back scattered electrons deflected after traversing
3 across the surface of the specimen.
- 1 15. An apparatus as recited in claim 13, wherein the specimen being scanned is a
2 semiconductor wafer.
- 1 16. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the orientation of the specimen in response to the application of an
3 appropriate voltage potential to the particle beam deflecting means.
- 1 17. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of 1° and 89° .
- 1 18. An apparatus as recited in claim 17, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of 15° and 75° .
- 1 19. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of 91° and 179° .

- 1 20. An apparatus as recited in claim 19, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of 105° and 165°.
- 1 21. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of -179° and -91°.
- 1 22. An apparatus as recited in claim 21, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of -105° and -165°.
- 1 23. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of -89° and -1°.
- 1 24. An apparatus as recited in claim 23, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of -15° and -75°.
- 1 25. A method of scanning the surface of a semiconductor wafer, using a Scanning Electron
2 Microscope comprising the steps of:
3 generating a particle beam from a particle beam emitter; and
4 scanning the surface of the specimen by deflecting the particle beam at an angle with
5 respect to the orientation of the semiconductor wafer such that the particle beam traverses an
6 angle that is not parallel or perpendicular to the orientation of the semiconductor wafer.
- 1 26. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the orientation of the semiconductor wafer in response to the application of an
3 appropriate voltage potential to the particle beam bending means.
- 1 27. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of 1° and 89°.
- 1 28. A method as recited in claim 27, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of 15° and 75°.
- 1 29. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of 91° and 179°.

1 30. A method as recited in claim 29, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of 105° and 165°.

1 31. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of -179° and -91°.

1 32. A method as recited in claim 31, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of -105° and -165°.

1 33. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of -89° and -1°.

1 34. A method as recited in claim 33, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of -15° and -75°.

1 35. A method as recited in claim 25, further comprising: collecting the secondary and back
2 scattered electrons generated when the particle beam traverses across the surface of the
3 semiconductor wafer.